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Application No. 10/593,611
Filed: September 21, 2006
TC Art Unit: 2834
Confirmation No.: 1529

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims.

1. (Currently amended) An active magnetic bearing with autodetection of position, the bearing comprising a stator comprising at least first and second opposing electromagnets ~~forming stators~~, said stator disposed ~~on either side of~~ about a ferromagnetic body forming a rotor ~~and~~ held without contact between said electromagnets, the first and second electromagnets each comprising a magnetic circuit essentially constituted by a first portion comprising a first ferromagnetic material and co-operating with said ferromagnetic body to define an airgap, together with an excitation coil powered from a power amplifier whose input current is servo-controlled as a function of the position of the ferromagnetic body relative to the magnetic circuits of the first and second electromagnets, the position of the ferromagnetic body being measured from the inductance detected between the two electromagnets in response to simultaneous injection into both opposing electromagnets of a sinusoidal current at a frequency that is greater than the closed loop passband of the system,

the bearing being characterized in that the magnetic circuit of each electromagnet further includes a second portion comprising a second ferromagnetic material having magnetic permeability that is lower than that of the first ferromagnetic material and electrical resistivity that is higher than that of the first ferromagnetic material so as to encourage the passage of the high frequency magnetic fields that are generated in the bearing,

wherein the second portion is located between the first portion and the excitation coil, and

wherein said first ferromagnetic material comprises a plurality of ferromagnetic laminations stacked in a direction parallel to an axial length of the rotor.

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2. (Previously presented) A bearing according to claim 1, characterized in that the second portion is formed by a piece made of powder comprising grains of magnetic material that are electrically insulated from one another.

3. (Original) A bearing according to claim 2, characterized in that the powder comprises grains of iron that are electrically insulated from one another.

4. (Previously presented) A bearing according to claim 1, characterized in that the ferromagnetic body forming the rotor includes at least one portion of ferromagnetic material having magnetic permeability that is lower and electrical resistivity that is greater than a remainder of said body so as to encourage the passage of high frequency magnetic fields, said portion being disposed substantially in register with each of the second portions formed in the electromagnet.

5. (Previously presented) A bearing according to claim 4, characterized in that the at least one low magnetic permeability and high electrical resistivity portion of the ferromagnetic rotor-forming body is formed by a part made of powder comprising grains of magnetic material that are electrically insulated from one another.

6. (Original) A bearing according to claim 5, characterized in that the powder comprises grains of iron that are electrically insulated from one another.

7. (Previously presented) A bearing according claim 4, characterized in that the ferromagnetic rotor-forming body includes a stack of ferromagnetic laminations, the laminations present in the low permeability and high resistivity portion each having a thickness that is smaller than a thickness of those other laminations in the stack.

8. (Previously presented) A bearing according to claim 1, characterized in that each of the second portions presents a magnetic permeability of about 100.

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9. (Previously presented) A bearing according to claim 1, characterized in that each of the second portions presents an electrical resistivity of about 50 Ωm.

10. Canceled

11. (Previously presented) A bearing according to claim 1, characterized in that the active magnetic bearing is of the radial type.

12. (Previously presented) A bearing according to claim 3, characterized in that:

the ferromagnetic body forming the rotor includes at least one portion of ferromagnetic material having magnetic permeability that is lower and electrical resistivity that is greater than a remainder of said body so as to encourage the passage of high frequency magnetic fields, said at least one portion being disposed substantially in register with each of the second portions formed in the electromagnet;

wherein the low magnetic permeability and high electrical resistivity portion of the rotor-forming body is formed by a part made of powder comprising grains of magnetic material that are electrically insulated from one another; and

wherein the powder comprises grains of iron that are electrically insulated from one another.

13. (Previously presented) A bearing according to claim 4, characterized in that each of the low magnetic permeability and high electrical resistivity portions presents magnetic permeability of about 100.

14. (Currently amended) A bearing according to claim 7, characterized in that:

each of the low magnetic permeability and high electrical resistivity portions presents magnetic permeability of about 100; and

each of the low magnetic permeability and high electrical resistivity portions presents electrical resistivity of about 50 Ωm~~; and~~

~~the active magnetic bearing is of the axial type~~.

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15. (Previously presented) A bearing according to claim 7, characterized in that:

each of the low magnetic permeability and high electrical resistivity portions presents magnetic permeability of about 100;

each of the low magnetic permeability and high electrical resistivity portions presents electrical resistivity of about 50 Ωm; and

the active magnetic bearing is of the radial type.

16 - 18. (Canceled)

19. (Currently amended) An active magnetic radial bearing, comprising:

a stator; and

a rotor configured to rotate relative to the stator,

wherein the stator comprises an excitation coil, a first stator portion comprising first ferromagnetic material comprising a ~~stack~~ plurality of ferromagnetic laminations ~~arranged~~ stacked in a direction parallel to an axial length of the rotor and a second stator portion comprising a second ferromagnetic material, the excitation coil surrounding the first and second stator portions, the second stator portion being located between the first stator portion and the excitation coil, and

wherein the second ferromagnetic material of the second stator portion has a magnetic permeability that is lower than a magnetic permeability of the first stator portion and the second ferromagnetic material has an electrical resistivity that is higher than an electrical resistivity of the first stator portion, and

wherein the rotor comprises a first rotor portion and a second rotor portion disposed over an axial length of the rotor and substantially in register with, respectively, the first and second stator portions, and

wherein the second rotor portion has a magnetic permeability that is lower than a magnetic permeability of the first rotor portion and the second rotor portion has an electrical resistivity that is higher than an electrical resistivity of the first rotor portion.

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20. (Previously presented) The active magnetic radial bearing of claim 19, wherein:

the first rotor portion comprises a first stack of ferromagnetic laminations arranged parallel to the axial length of the rotor, wherein each lamination in the first stack is of a first thickness; and

the second rotor portion comprises a second stack of ferromagnetic laminations arranged parallel to the axial length of the rotor, wherein each of the laminations in the second stack is of a second thickness,

wherein the second thickness is smaller than the first thickness.

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